REMARKS

This amendment is responsive to the Non-Final Office Action mailed on June 27, 2008. Claims 1, 3-5, 7-10, 13, and 15-24 stand rejected. Claims 20-24 have been canceled from further consideration in this application. Applicant is not conceding that the subject matter encompassed by the canceled claims prior to this Amendment is not patentable over the art cited by the Examiner. Applicant respectfully reserves the right to pursue additional claims, including the subject matter encompassed by the canceled claims, as presented prior to this Amendment, in one or more continuing applications. In view of the following remarks, Applicant respectfully submits that this application is in complete condition for allowance and requests reconsideration of the application in this regard

Applicant respectfully traverses the Examiner's rejections to the extent that they are maintained.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1, 3-5, 9, 10, 13, 15, and 18-24 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,757,677 to Pham et al. (*Pham*) in view of U.S. Patent No. 6,662,175 to Ghazal et al. (*Ghazal*). Claims 20-24 have been canceled rendering their rejections moot. Of the remaining claims, claims 1, 10, and 13 represent the independent claims. *Pham* is directed to performing a join of multiple tables in response to receiving a query containing WHERE and GROUP BY clauses. The join is performed by reducing the number of active rows of at least one of the tables to be joined prior to performing the join operation. The passage of *Ghazal* cited by the Examiner (col. 3, lines 9-36) briefly discloses a query containing at least one of a WHERE clause and a GROUP BY clause and then proceeds to define the function of the GROUP BY and WHERE clauses.

With respect to claim 1, on page 3 of the Office Action, the Examiner states that *Pham* fails to disclose applying a transitive closure analysis to at least one search condition in the query to indentify an equivalent field for a field referenced in the criteria, and based on the transitive closure analysis, rewriting the criteria to generate modified criteria to reduce the number of table referenced thereby by substituting the equivalent field for the referenced field in the criteria to generate modified criteria that referenced only one table, based on transitive

closure analysis. The Examiner contends that this deficiency is supplied by *Ghazal*. *Ghazal* contains two occurrences of the term transitive closure. The first occurrence is in the passage cited by the Examiner in the background of the disclosure. Here *Ghazal* merely states that transitive closure is one of a number of syntactic or algebraic transformations that may be used for query transformation. However this passage gives no further details to how one of ordinary skill in the art would use any of the disclosed syntactic or algebraic transformations to assist the query optimizer in performing query transformations. This passage certainly fails to disclose or even suggest applying transitive closure analysis to at least one search condition in the query to identify an equivalent field referenced in the criteria and using the analysis to rewrite the criteria to reduce the number of tables referenced thereby.

The second occurrence of the term transitive closure can be found in *Ghazal* at col. 5 line 57- col. 6 line 8. This passage discusses performing a transitive closure of the where-clause conditions to calculate new date constraints which could reduce the size of the intermediate result that is generated. This passage also fails to disclose or suggest using transitive closure analysis to rewrite the criteria to reduce the number of tables referenced in a query. Moreover, *Ghazal* fails to disclose or suggest "applying transitive closure analysis to at least one search condition in the query [having a GROUP BY or ORDER BY clause] to identify an equivalent field for a field reference in the criteria" and "based on the transitive closure analysis, rewriting the criteria to generate modified criteria to reduce the number of tables referenced thereby" anywhere in the reference.

Further on page 4 of the Office Action, the Examiner states that it would have been obvious to one of ordinary skill in the art to apply the transitive closure disclosed in *Ghazal* to optimize the query of *Pham*. The Examiner further states that one would have been motivated to do so since it is well known that query optimization improves overall performance which reduces resource utilization. However, even if the transitive closure techniques disclosed in *Ghazal* with respect to WHERE clauses were applied to the GROUP BY operation of *Pham*, one of ordinary skill in the art would use the transitive closure analysis to assist in reducing the number of rows prior to a join operation as disclosed in *Pham*. It is only through hindsight and the benefit of Applicant's disclosure that the Examiner is able to assert that one skilled in the art would use the transitive closure analysis in *Ghazal* in *Pham* to "rewrit[e] the criteria to generate modified criteria to reduce the number of tables referenced thereby by substituting the equivalent

field for the field referenced in the criteria" as recited in Applicant's claim 1, when there is no teachings or suggestions in either reference to reduce the number of tables. Rather both references teach reducing the table sizes prior to a join operation. Applicant submits that the Examiner has failed to establish a prima facie case of obviousness and therefore Applicant's independent claim 1 is patentable over the combination of *Pham* and *Ghazal*. Consequently, Applicant respectfully requests that the rejection of claim 1 be withdrawn.

The Examiner has rejected dependent claims 3-5, and 9 as also being unpatentable over *Pham* in view of *Ghazal*. These claims depend from independent claim 1 and are patentable over *Pham* and *Ghazal* for at least the same reasons set forth above. Furthermore, these dependent claims recite unique combinations of elements not disclosed or suggested by *Pham* and *Ghazal*. Therefore, Applicant respectfully requests that the rejections of claims 3-5 and 9 be withdrawn.

The Examiner has rejected independent claim 10 as being unpatentable over *Pham* in view of *Ghazal*. Similar to the rejection of claim 1, the Examiner states that *Pham* fails to disclose generating a modified criteria using transitive closure analysis by substituting the equivalent field for the field references in the criteria, wherein the criteria references a plurality of tables and the modified criteria references a single table. The Examiner then states on page 6 of the Office Action that "while *Ghazal* discloses referencing only one row, *Ghazal* fails to disclose referencing only one table." The Examiner then states that it would have been obvious to one of ordinary skill in the art to apply the concept of referencing only one row in order to reference only one table and one would be motivated to do so since this is the basic purpose of query rewrite. However, one of ordinary skill in the art would know that there is a big difference between referencing rows of table and referencing tables generally. Moreover, as set forth above, neither *Pham* nor *Ghazal* disclose or suggest using transitive closure analysis to rewrite query criteria that references multiple tables to reference a single table and that it is only through hindsight and the benefit of Applicant's disclosure that the Examiner can make these assertions. Therefore, for the same or similar reasons as set forth with respect to independent claim 1, independent claim 10 is also patentable over *Pham* in view of *Ghazal*, and Applicant respectfully requests that the rejection for claim 10 be withdrawn.

The Examiner has rejected independent claim 13 as being unpatentable over *Pham* in view of *Ghazal*. The Examiner states on page 7 of the Office Action that *Ghazal*

discloses query optimization including the further limitations of applying transitive closure analysis to a plurality of search conditions in the query to determine a subset of equivalent fields and rewriting a criteria to generate a set of respective modified criteria that each reference one more equivalent search fields in col. 1 lines 7-9 and 22-36, which is not disclosed in *Pham*. The Examiner additionally states that *Ghazal* discloses selecting join order from among a plurality of join orders for the plurality of join operations using at least one of the set of respective modified criteria at col. 1 lines 37-38, which is also not disclosed in *Pham*. As set forth above with respect to claim 1, col. 1 of *Ghazal* fails to disclose applying transitive closure to a plurality of search conditions. The background of *Ghazal* merely lists transitive closure as one of a number of techniques used by query optimizers with no further teachings of how they are used. Further lines 37-38 of *Ghazal* disclose, "The basic purpose of a query rewrite is to reduce the number of rows processed during the query." Nowhere in this passage does *Ghazal* disclose selecting join order from among a plurality of join operations as contended by the Examiner. Furthermore as set for the above, *Ghazal* discloses using transitive closure analysis to reduce the size of an intermediate result at col. 5, line 56 – col. 6 line 17. However, *Ghazal* fails to disclose applying the analysis to a plurality of search conditions, much less selecting a join order from among a plurality of join orders for the plurality of join operations using at least one of the set of respective criteria modified by the transitive closure analysis. Therefore the combination of *Pham* and *Ghazal* fail to disclose all of the elements of Applicant's claim 13. Furthermore, the Examiner has provided no motivation to modify the combination of *Pham* and *Ghazal* to contain the elements of Applicant's claim 13. The Examiner merely makes a generalized statement that query optimization improves overall performance which reduces resource utilization. For these reasons, Applicants submit that independent claim 13 is patentable over *Pham* in view of *Ghazal* and respectfully request that the rejection for claim 13 be withdrawn.

The Examiner has rejected dependent claims 15-19 as also being unpatentable over *Pham* in view of *Ghazal*. These claims depend from independent claim 13 and are patentable over *Pham* and *Ghazal* for at least the same reasons set forth above. Furthermore, these dependent claims recite unique combinations of elements not disclosed or suggested by *Pham* and *Ghazal*. Therefore, Applicant respectfully requests that the rejections of claims 15-19 be withdrawn.

The Examiner has rejected dependent claims 7-8 and 16-17 as being unpatentable over *Pham* in view of *Ghazal* and further in view of U.S. Patent No 5,598,559 to Chaudhuri (*Chaudhuri*). *Chaudhuri* is directed to an optimization technique for a query having a GROUP BY clause. The optimization technique generates execution plans, which places the GROUP BY preceding every internal join node. The optimizer then estimates the cost of each of these execution plans and selects the plan having the lowest estimated cost. With respect to dependent claims 7 and 8, the Examiner contends that *Chaudhuri* discloses building indices over columns at col. 7, line 55 – col. 8, line 26. In this passage, *Chaudhuri* discloses a relation index which is used to optimize the sub-queries within a query containing at least one join. This passage fails to disclose building an index over a column. Furthermore, there is no disclosure in *Chaudhuri* to remedy the deficiencies of *Pham* and *Ghazal* identified above with respect to the rejection of independent claim 1, from which these claims depend. For these reasons, Applicant respectfully requests that the rejections of dependent claims 7 and 8 be withdrawn.

With respect to dependent claims 16 and 17, these claims depend from independent claim 13. As set forth above, *Chaudhuri* fails to remedy the deficiencies of *Pham* and *Ghazal*, and therefore for the same or similar reasons set forth above, Applicants submit that dependent claims 16 and 17 are also patentable and respectfully request that the rejections for these claims should be withdrawn.

Conclusion

Applicant has made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing amendments to the claims and remarks given herein, Applicant respectfully believes this case is in condition for allowance and respectfully requests allowance of the pending claims. If the Examiner believes any detailed language of the claims requires further discussion, the Examiner is respectfully asked to telephone the undersigned attorney so that the matter may be promptly resolved. The Examiner's prompt attention to this matter is appreciated.

Applicant is of the opinion that no additional fee is due as a result of this Amendment. Payment of all charges due for this filing is made on the attached Electronic Fee Sheet. If any additional charges or credits are necessary to complete this communication, please apply them to Deposit Account No. 23-3000.

Respectfully submitted,

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Date

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